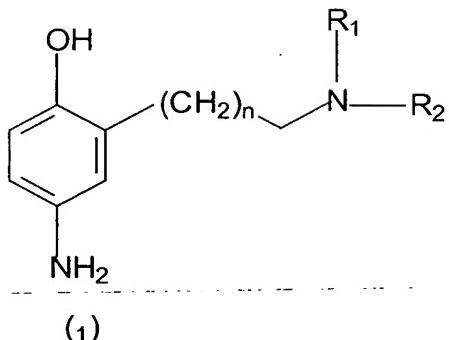


We claim:

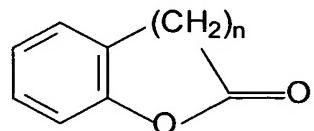
1. A compound of formula (1):



wherein R_1 and R_2 are each independently selected the group consisting of a hydrogen atom, a C_1 to C_5 alkyl or hydroxyalkyl group, or R_1 and R_2 together with the nitrogen atom to which they are attached form a 5 or 6 member cyclic ring optionally containing one or more additional atoms selected from O, N or S atoms, and n is equal to 1 or 2, with the proviso that when n is equal to 2 only one of R_1 and R_2 may be hydrogen.

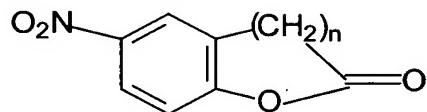
2. A compound of Claim 1 wherein R_1 and R_2 are each individually selected from the group consisting of hydrogen atom, a C_1 to C_3 alkyl group, or R_1 and R_2 together with the nitrogen atom to which they are bound form a piperazine, piperidine, imidazole, or morpholine ring.
3. A compound of Claim 2 wherein R_1 and R_2 are both alkyl groups.
4. A compound of Claim 2 wherein R_1 and R_2 form a piperidine ring.
5. A compound of Claim 3 wherein R_1 and R_2 form an imidazole ring.

6. A compound of Claim 3 wherein R₁ and R₂ are both methyl.
7. A process for the preparation of a compound of formula (1) of Claim 1 comprising (a) nitrating a compound of formula (2)



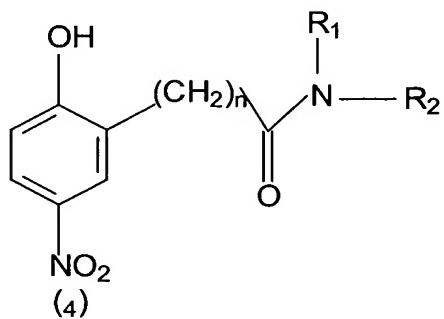
(2)

to produce a compound of formula (3)



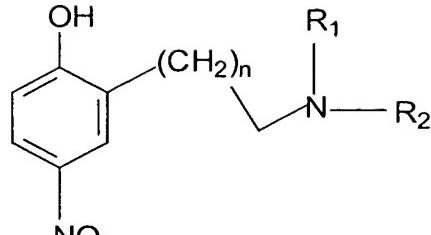
(3)

- (b) reacting the compound of formula (3) with a reagent of the formula R₁R₂NH to produce a compound of formula (4)



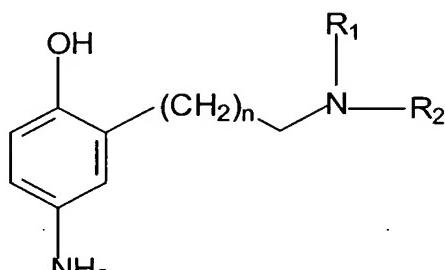
- (c) subjecting the compound of formula (4) to reduction by reaction with a borane-THF complex to produce a compound of formula (5)

40052323-011802



(5)

and (d) then catalytically hydrogenating the compound of formula (5) to produce a compound of formula (1).



(1)

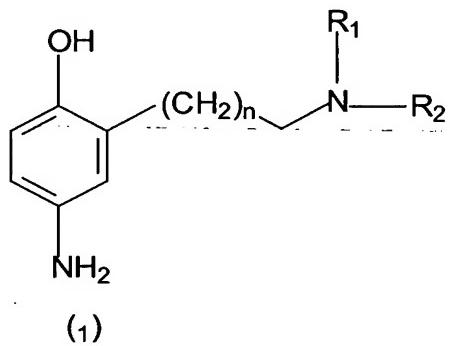
wherein n, R₁ and R₂ are as defined in Claim 1.

8. A process according to Claim 7 wherein R₁ and R₂ are each individually selected from the group consisting of hydrogen atom, a C₁ to C₃ alkyl group, or R₁ and R₂ together with the nitrogen atom to which they are bound form a piperazine, piperidine, imidazole, or morpholine ring.

9. A process according to Claim 7 wherein R₁ and R₂ are both alkyl groups.

10. A process according to Claim 7 wherein R₁ and R₂ form a piperidine ring.

11. A hair dye product comprising a hair dyeing composition containing at least one primary intermediate and at least one coupler and a developer composition containing one or more oxidizing agents, The hair dyeing composition containing a primary intermediate comprising a compound of formula (1):



wherein R₁ and R₂ are each independently selected from the group consisting of a hydrogen atom, a C₁ to C₅ alkyl or hydroxyalkyl group, or R₁ and R₂ together with the nitrogen atom to which they are attached form a 5 or 6 member cyclic ring optionally containing one or more additional atoms selected from O, N or S atoms, and n is equal to 1 or 2, with the proviso that when n is equal to 2 only one of R₁ and R₂ may be hydrogen.

12. A hair dye product according to Claim 11 wherein the hair dyeing composition additionally comprises a primary intermediate selected from the group consisting of: 2-methyl-benzene-1,4-diamine, benzene-1,4-diamine, 2-(2,5-diamino-phenyl)-ethanol, 1-(2,5-diamino-phenyl)-ethanol, 2-[(4-amino-phenyl)-(2-hydroxy-ethyl)-amino]-ethanol, 4-amino-phenol, 4-methylamino-phenol, 4-amino-3-methyl-phenol, 1-(5-amino-2-hydroxy-phenyl)-ethane-1,2-diol, 2-amino-phenol, 2-amino-5-methyl-phenol, 2-amino-6-methyl-phenol, N-(4-amino-3-hydroxy-phenyl)-acetamide, pyrimidine-2,4,5,6-tetramine, 2-(4,5-diamino-1H-pyrazol-1-yl)ethanol, 1-(4-methylbenzyl)-1H-pyrazole-4,5-diamine, and 1-(benzyl)-1H-pyrazole-4,5-diamine.

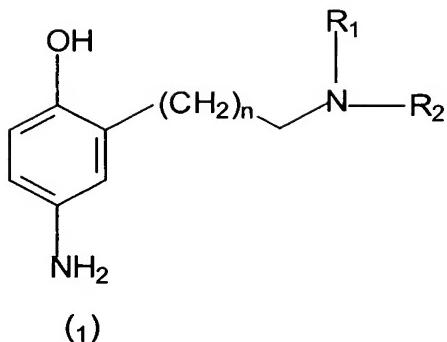
2025 RELEASE UNDER E.O. 14176

13. A hair dye product according to Claim 11 wherein the coupler present in the hair dyeing composition is selected from the group consisting of: benzene-1,3-diol, 4-chlorobenzene-1,3-diol, naphthalen-1-ol, 2-methyl-naphthalen-1-ol, 2-methyl-benzene-1,3-diol, 2-(2,4-diamino-phenoxy)-ethanol, 2-(3-amino-4-methoxy-phenylamino)-ethanol, 2-[2,4-diamino-5-(2-hydroxy-ethoxy)-phenoxy]-ethanol, and 3-(2,4-diamino-phenoxy)-propan-1-ol, 3-amino-phenol, 5-amino-2-methyl-phenol, 5-(2-hydroxy-ethylamino)-2-methyl-phenol, 3-amino-2-methyl-phenol, 3,4-dihydro-2H-1,4-benzoxazin-6-ol, 4-methyl-2-phenyl-2,4-dihydro-3H-pyrazol-3-one, 1H-indol-6-ol, and 2-aminopyridin-3-ol.

14. A hair dye product according to Claim 13 wherein the hair dyeing composition additionally comprises a primary intermediate selected from the group consisting of: 2-methyl-benzene-1,4-diamine, benzene-1,4-diamine, 2-(2,5-diamino-phenyl)-ethanol, 1-(2,5-diamino-phenyl)-ethanol, 2-[(4-amino-phenyl)-(2-hydroxy-ethyl)-amino]-ethanol, 4-amino-phenol, 4-methylamino-phenol, 4-amino-3-methyl-phenol, 1-(5-amino-2-hydroxy-phenyl)-ethane-1,2-diol, 2-amino-phenol, 2-amino-5-methyl-phenol, 2-amino-6-methyl-phenol, N-(4-amino-3-hydroxy-phenyl)-acetamide, pyrimidine-2,4,5,6-tetramine, 2-(4,5-diamino-1H-pyrazol-1-yl)ethanol, 1-(4-methylbenzyl)-1H-pyrazole-4,5-diamine, and 1-(benzyl)-1H-pyrazole-4,5-diamine.

15. A hair dye product according to Claim 11 wherein R₁ and R₂ are each individually selected from the group consisting of hydrogen atom, a C₁ to C₃ alkyl group, or R₁ and R₂ together with the nitrogen atom to which they are bound form a piperazine, piperidine, imidazole, or morpholine ring.

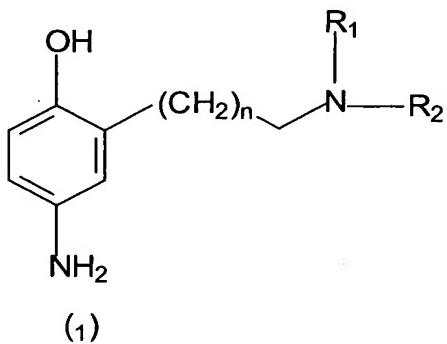
16. In a hair dyeing system wherein at least one primary intermediate is reacted with at least one coupler in the presence of an oxidizing agent to produce an oxidative hair dye, the improvement wherein the at least one primary intermediate comprises a compound of the formula (1):



wherein R₁ and R₂ are each independently selected from the group consisting of a hydrogen atom, a C₁ to C₅ alkyl or hydroxyalkyl group, or R₁ and R₂ together with the nitrogen atom to which they are attached form a 5 or 6 member cyclic ring optionally containing one or more additional atoms selected from O, N or S atoms, and n is equal to 1 or 2, with the proviso that when n is equal to 2 only one of R₁ and R₂ may be hydrogen.

17. A hair dyeing composition comprising, in a suitable carrier or vehicle, an effective hair dyeing amount of:

- (a) at least one coupler, and
- (b) at least one primary intermediate comprising a compound of the formula (1):



wherein R₁ and R₂ are each independently selected from the group consisting of a hydrogen atom, a C₁ to C₅ alkyl or hydroxyalkyl group, or R₁ and R₂ together with the nitrogen atom to which they are attached form a 5 or 6 member cyclic ring optionally containing one or more additional atoms

selected from O, N or S atoms, and n is equal to 1 or 2, with the proviso that when n is equal to 2 only one of R₁ and R₂ may be hydrogen.

18. A hair dyeing composition of Claim 17 wherein R₁ and R₂ are each individually selected from the group consisting of hydrogen atom, a C₁ to C₃ alkyl group, or R₁ and R₂ together with the nitrogen atom to which they are bound form a piperazine, piperidine, imidazole, or morpholine ring.

19. A hair dyeing composition according to Claim 17 additionally comprising a primary intermediate selected from the group consisting of: 2-methyl-benzene-1,4-diamine, benzene-1,4-diamine, 2-(2,5-diamino-phenyl)-ethanol, 1-(2,5-diamino-phenyl)-ethanol, 2-[(4-amino-phenyl)-(2-hydroxy-ethyl)-amino]-ethanol, 4-amino-phenol, 4-methylamino-phenol, 4-amino-3-methyl-phenol, 1-(5-amino-2-hydroxy-phenyl)-ethane-1,2-diol, 2-amino-phenol, 2-amino-5-methyl-phenol, 2-amino-6-methyl-phenol, N-(4-amino-3-hydroxy-phenyl)-acetamide, pyrimidine-2,4,5,6-tetramine, 2-(4,5-diamino-1H-pyrazol-1-yl)ethanol, 1-(4-methylbenzyl)-1H-pyrazole-4,5-diamine, and 1-(benzyl)-1H-pyrazole-4,5-diamine.

20. A hair dyeing composition according to Claim 19 wherein the at least one coupler is selected from the group consisting of: benzene-1,3-diol, 4-chlorobenzene-1,3-diol, naphthalen-1-ol, 2-methyl-naphthalen-1-ol, 2-methyl-benzene-1,3-diol, 2-(2,4-diamino-phenoxy)-ethanol, 2-(3-amino-4-methoxy-phenylamino)-ethanol, 2-[2,4-diamino-5-(2-hydroxy-ethoxy)-phenoxy]-ethanol, and 3-(2,4-diamino-phenoxy)-propan-1-ol, 3-amino-phenol, 5-amino-2-methyl-phenol, 5-(2-hydroxy-ethylamino)-2-methyl-phenol, 3-amino-2-methyl-phenol, 3,4-dihydro-2H-1,4-benzoxazin-6-ol, 4-methyl-2-phenyl-2,4-dihydro-3H-pyrazol-3-one, 1H-indol-6-ol, and 2-aminopyridin-3-ol.

21. A hair dyeing composition according to Claim 17 wherein the at least one coupler is selected from the group consisting of: benzene-1,3-diol, 4-chlorobenzene-1,3-diol, naphthalen-1-ol, 2-methyl-naphthalen-1-ol, 2-

methyl-benzene-1,3-diol, 2-(2,4-diamino-phenoxy)-ethanol, 2-(3-amino-4-methoxy-phenylamino)-ethanol, 2-[2,4-diamino-5-(2-hydroxy-ethoxy)-phenoxy]-ethanol, and 3-(2,4-diamino-phenoxy)-propan-1-ol, 3-amino-phenol, 5-amino-2-methyl-phenol, 5-(2-hydroxy-ethylamino)-2-methyl-phenol, 3-amino-2-methyl-phenol, 3,4-dihydro-2H-1,4-benzoxazin-6-ol, 4-methyl-2-phenyl-2,4-dihydro-3H-pyrazol-3-one, 1H-indol-6-ol, and 2-aminopyridin-3-ol.

22. A hair coloring composition according to Claim 17 wherein R₁ and R₂ are both alkyl groups.

23. A process for dyeing hair comprising forming a hair dye product composition by mixing a developer composition and a hair dyeing composition as defined in Claim 17, applying to the hair an amount of the hair dye product composition effective to dye the hair, permitting the hair dye product composition to contact the hair for period of time effective to dye the hair, and removing the hair dye product composition from the hair.

10050223-01-602